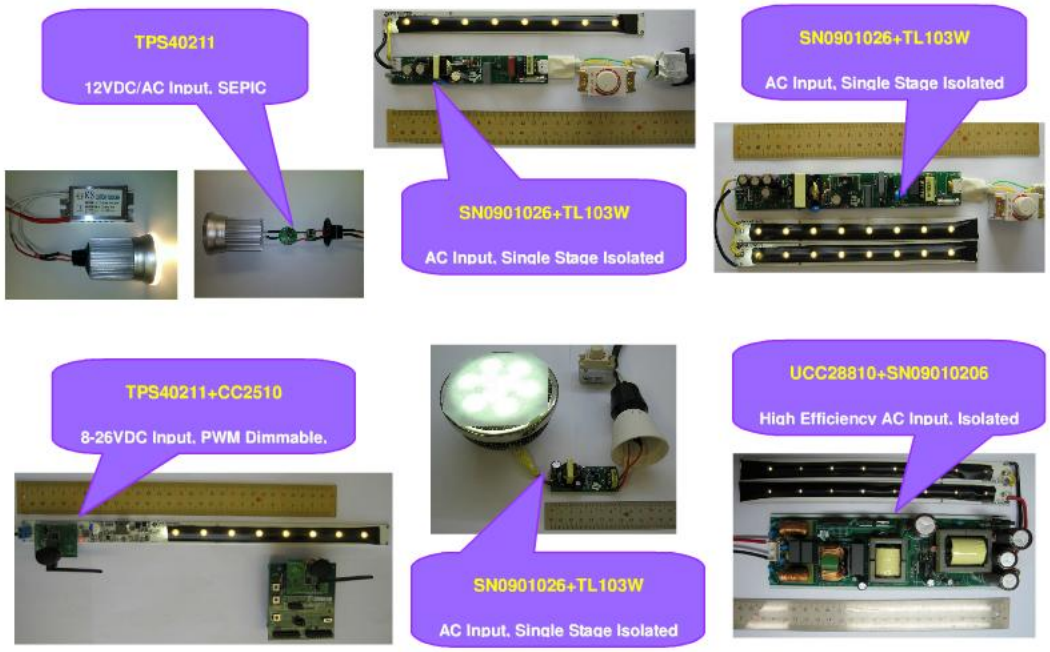
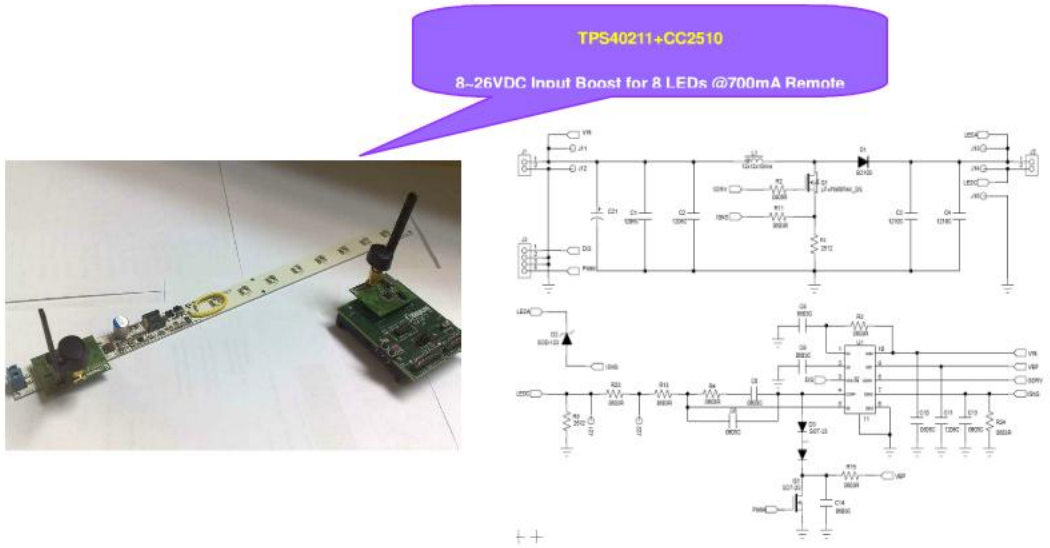
TI

LED Lighting Power Reference Designs



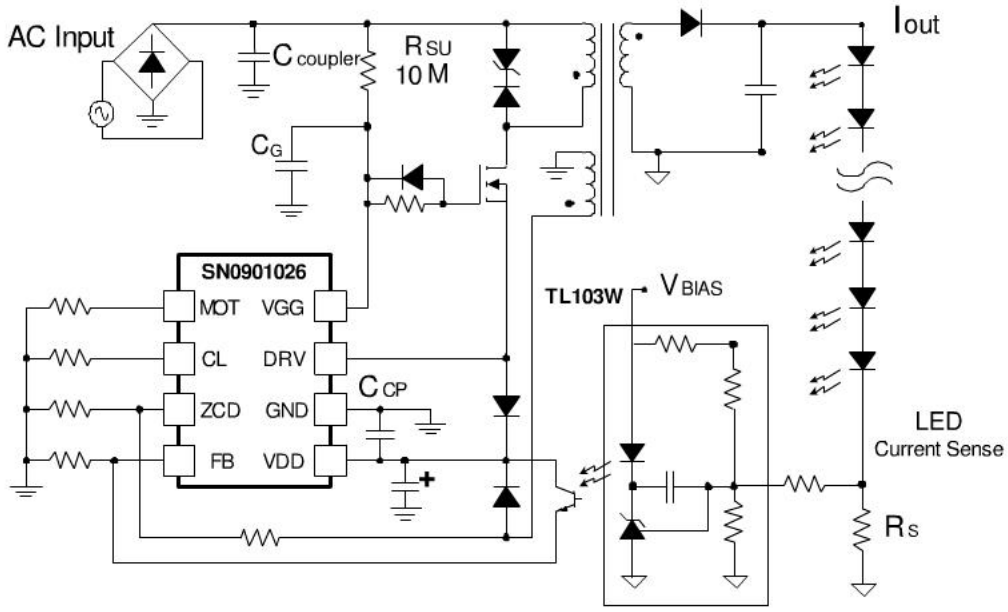
1. DC Boost LED Driver with Remote Control



2. Single Stage AC/DC Isolated LED Driver

Application	TI Parts	Output Power	Input Voltage	Output Current
AC/DC Isolated LED Driver with Front-End (TRIAC) Dimming Compatible	SN0109026+ TL103W	10W/ 25W/ 50W	90-265 Vrms	350mA~500mA Up to 700mA

Figure: Simplified Application



Key Features and Benefits:

- **Single Stage Design**
  - Requires only one Simple Power Converter
- **Phase-Angle "TRIAC" Dimmable**
  - Operates down to Minimum Input Setting
  - Can be used with Traditional Wall Dimmers
- **Natural PF Correction and Low THD**
  - Operates down to Minimum Input Setting
  - Can be used with Traditional Wall Dimmers
- **High Efficiency & Current Accuracy**
  - Minimizes thermal management
- **Isolated Design meets Safety Requirement**

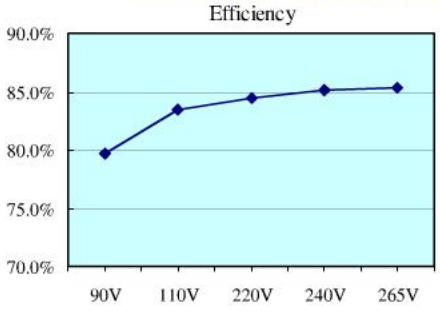
3. 10W Design (SN0901026+TL103W)

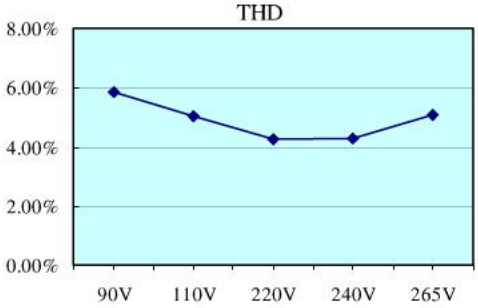
10W Design SN0901026+TL103W

90V to 265VAC Input AC/DC for 9 LEDs @350mA

Vin	PF	Efficiency	THD	Iout
90V	0.998	79.7%	5.85%	353mA
110V	0.997	83.5%	5.02%	357mA
220V	0.985	84.5%	4.27%	356mA
240V	0.979	85.1%	4.31%	358mA
265V	0.968	85.3%	5.08%	358mA

Efficiency, THD, Power Factor Vs Line Voltage 9pcs LEDs at 350mA





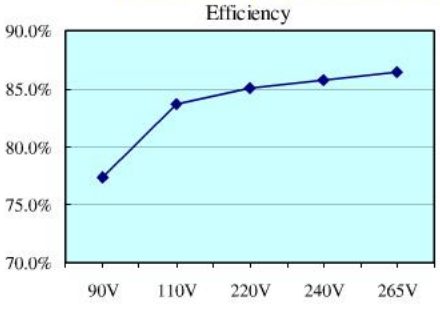
4. 25W Design (SN0901026+TL103W)

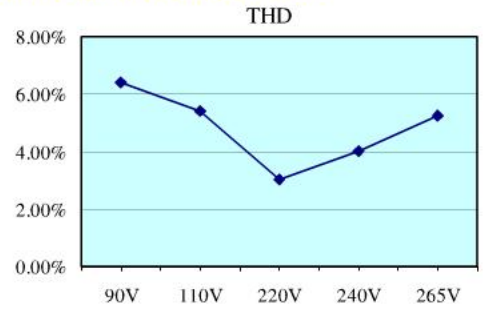
25W Design SN0901026+TL103W

90V to 265VAC Input AC/DC for 10 LEDs @700mA

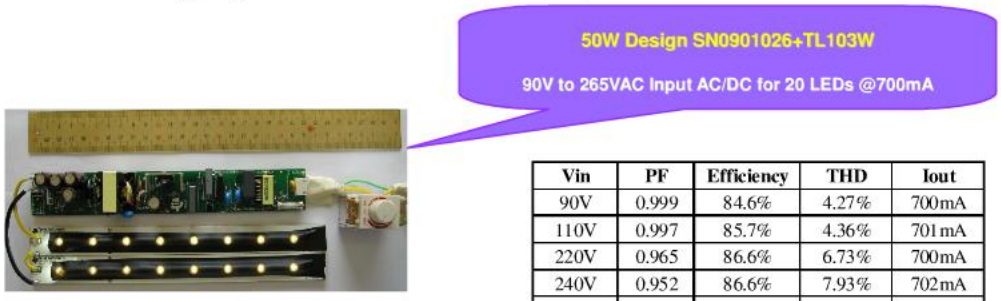
Vin	PF	Efficiency	THD	Iout
90V	0.998	77.4%	6.41%	696mA
110V	0.972	83.7%	5.41%	701mA
220V	0.974	85.1%	3.04%	706mA
240V	0.96	85.8%	4.03%	703mA
265V	0.939	86.5%	5.25%	700mA

Efficiency, THD, Power Factor Vs Line Voltage 10pcs LEDs at 700mA



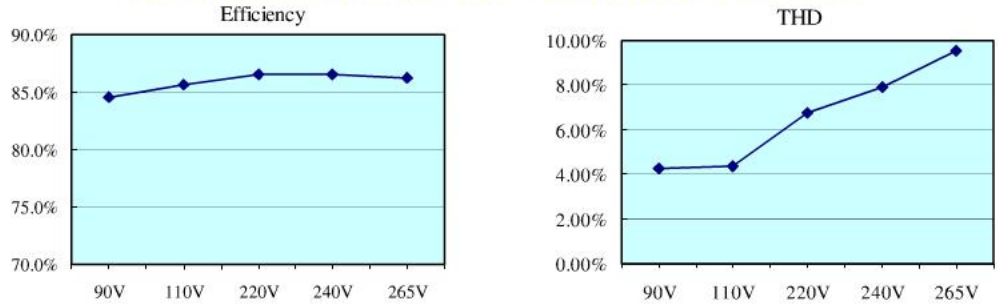


5. 50W Design (SN0901026+TL103W)



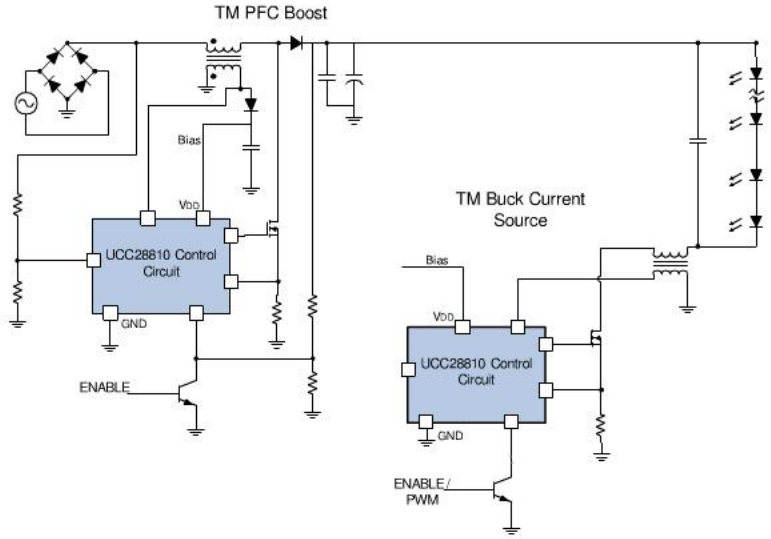
Vin	PF	Efficiency	THD	Iout
90V	0.999	84.6%	4.27%	700mA
110V	0.997	85.7%	4.36%	701mA
220V	0.965	86.6%	6.73%	700mA
240V	0.952	86.6%	7.93%	702mA
265V	0.931	86.3%	9.54%	701mA

Efficiency, THD, Power Factor Vs Line Voltage 20pcs LEDs at 700mA



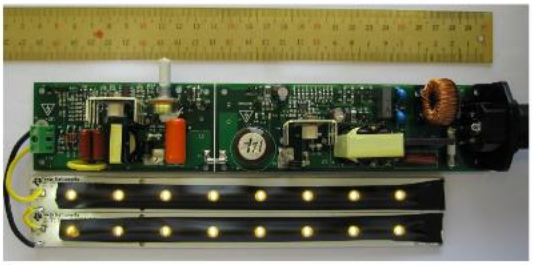
6. 100W Non-Isolated PFC+ Buck LED Driver

Application	TI Parts	Output Power	Input Voltage	Output Current
PR788: High Efficiency AC Power Factor Corrected, Dimmable LED Driver	UCC28810/11	100 W	90-264 Vrms	Up to 1000 mA



Benefits:

- **Extremely Robust**
- The LEDs are Well Protected
- **Extremely Simple to Use**
  - TM Buck Inherently Stable
  - No Compensation Required
- **High Efficiency**
  - High Power Density
- **Fast LED Current Response**
  - Well Suited for PWM Dimming

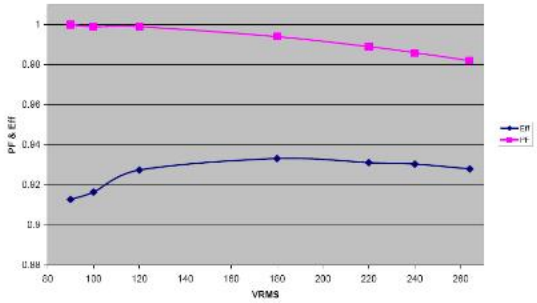


100W Non-Isolated Design (UCC28810+28811)

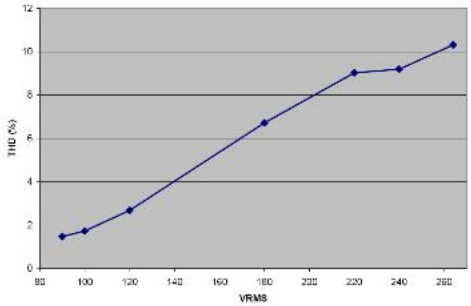
Parameter	Condition	Min	Typ	Max	Units
Vin RMS		90		264	VRMS
PFC Vout		235		415	VDC
PF	80-100W	0.95	0.97		
Pout, LED Dvr		45	80	100	W
$I_{AVG, LED}$	Setpoint: No PWM Dimming	0.84	0.90	0.96	A
$I_{AVG, LED}$ Line Regulation	90-264VRMS			0.03	A
Shutdown Thresh	PFC: J8 Pin 1 Buck: J9 Pin 1 #	0.72		1.1	V
PWM Thresh		0.72		1.3	V
PWM Frequency	Input Signal J9 Pin 3	200		1K	Hz
Efficiency	(Typ-Full Load)	90	93		%

PR788 Efficiency, THD, Power Factor Vs Line Voltage 30 Cree XRE LED's at 900mA

PR788 PF and Efficiency
30LEDs at 900mA, (95W)

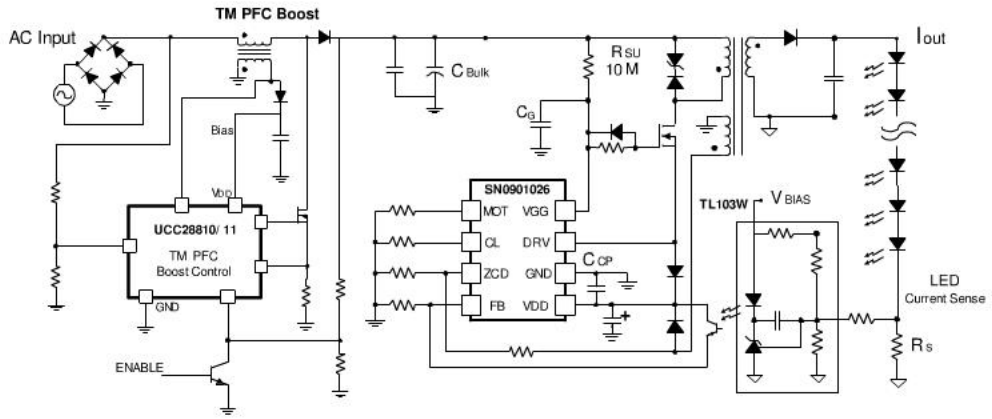


PR788 THD Vs Vin
95W LED Load



7. 100W Isolated PFC+ QR-Flyback LED Driver

Application	TI Parts	Output Power	Input Voltage	Output Current
High Efficiency AC/DC Isolated Power Factor Corrected, Dimmable LED Driver	UCC28810/11 +SN0901026	100 W	90-264 Vrms	Up to 700 mA



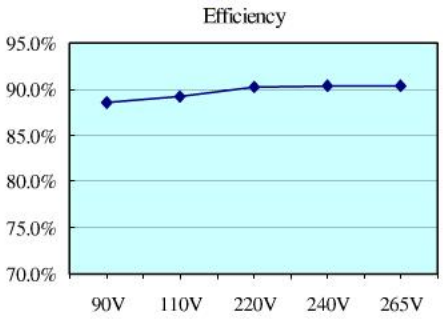
100W Design (UCC28810/11+SN0901026)

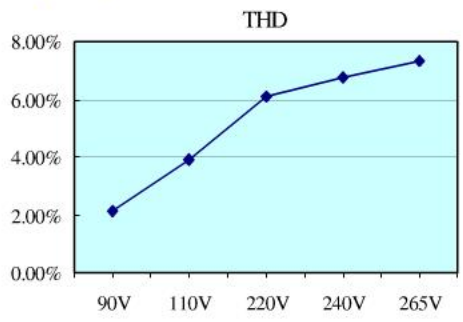
100W Design UCC28810+SN09010206

90V to 265VAC Input AC/DC for 40 LEDs @700mA

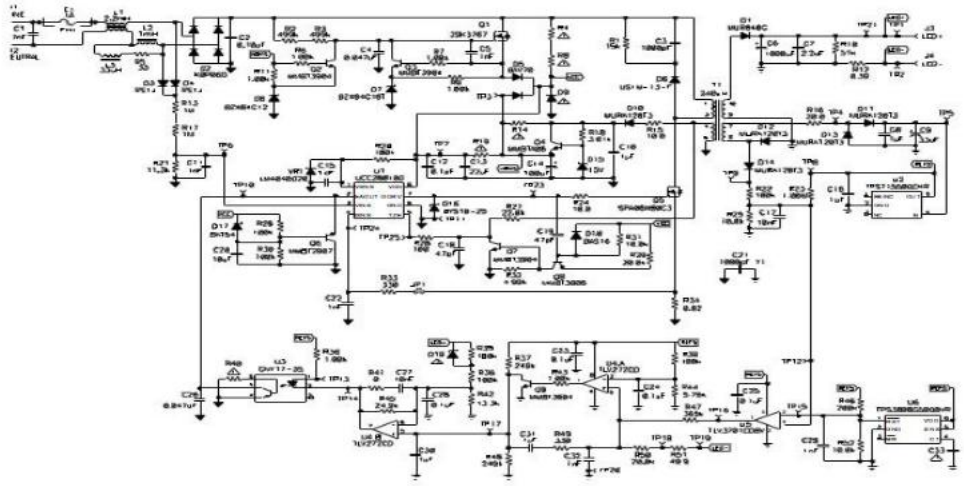
Vin	PF	Efficiency	THD	Iout
90V	0.999	88.5%	2.16%	701mA
110V	0.996	89.2%	3.91%	701mA
220V	0.951	90.2%	6.09%	702mA
240V	0.931	90.3%	6.78%	702mA
265V	0.91	90.4%	7.32%	702mA

Efficiency, THD, Power Factor Vs Line Voltage 40pcs LEDs at 700mA





8. 25W UCC28810 Design SCH



- 效率較高 > 0.8 (可以達到 0.85, 滿載時)
- 功率因素 > 0.9 (可以達到 0.97)
- 電流穩定性好
- 可實現 Triac 調光